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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/559,576

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Eugene Makeyev

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EXAMINER

SHIN, DANA H

ART UNIT

PAPER NUMBER

1635

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/559,576	Applicant(s) MAKEYEV ET AL.	
	Examiner DANA SHIN	Art Unit 1635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 14-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12-5-2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of claims 1-13 in the reply filed on October 29, 2008 is acknowledged. The traversal is on the ground(s) that Délye et al. did not teach the claimed invention therefore the technical feature of all claims defines a distinct and patentable contribution over Délye et al. This is not found persuasive because the claimed invention is found to lack a special technical features that makes a patentable contribution over prior art. See below for prior art rejections.

The requirement is still deemed proper and is therefore made FINAL.

Status of Claims

Currently, claims 1-28 are pending in the instant application. Claims 14-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected inventions, there being no allowable generic or linking claim. Accordingly, claims 1-13 are currently under examination on the merits in the instant case.

Information Disclosure Statement

The information disclosure statement filed on December 5, 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information

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or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Specification

The disclosure is objected to because of the following informalities:

- 1) The instant application contains Figures 1, 2, 3, and 5, thereby missing Figure 4.
- 2) The specification discloses brief description of the figures only for Figures 1, 2, and 3.
- 3) The abstract of the disclosure is objected to because it contains improper language.

Note that legal phraseology often used in patent claims, such as "said," should be avoided. See MPEP § 608.01(b).

Appropriate correction is required.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, 11, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 1 recites the limitation "said dsRNA products" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites that the nucleic acid target is operably linked with "determinants" essential for detectable replication by the polymerase. Similarly, claim 13 recites that the target nucleic acid is operably linked with "sequences" sufficient for detectable replication by the viral replication apparatus. However, neither the claims nor the specification defines what is encompassed by the claimed determinants that are essential for detectable replication by the polymerase or the claimed sequences that are sufficient for detectable replication by the viral replication apparatus, thereby rendering the claims vague and ambiguous.

Regarding claim 11, the phrase "such as" in line 2 renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipardi et al. (*Cell*, 2001, 107:297-307) in view of Hone (US 2004/0132678 A1) and Bej et al. (*Applied and Environmental Microbiology*, 1988, 54:2472-2477).

The claims are drawn to a method for mass production of dsRNA comprising providing nucleic acid target that can be replicated by an RNA-dependent RNA polymerase in a bacterial cell of *Pseudomonas syringae* and is incorporated into the genome of an RNA virus, wherein the RNA virus is an RNA bacteriophage phi-6, wherein the nucleotide acid target is delivered into cells by a suicide vector.

Lipardi et al. teach that double-stranded siRNAs comprising a target nucleotide sequence convert single-stranded mRNAs into double-stranded RNAs by serving as primers for an RNA-dependent RNA polymerase activity. As such, Lipardi et al. teach that one can produce target-specific double-stranded RNAs by providing a desired target mRNA nucleotide with an siRNA that is replicated by an RNA-dependent RNA polymerase. See pages 300-301; Figure 7A.

Lipardi et al. do not teach inserting the double-stranded siRNA comprising a target nucleotide sequence into the genome of an RNA bacteriophage phi-6 for mass production of dsRNAs, nor do they teach use of a suicide vector.

Hone teaches that double-stranded RNA bacteriophage phi-6 normally infects *Pseudomonas syringae* and that it has been demonstrated that exogenous genes inserted into the double-stranded RNA bacteriophage phi-6 are continuously produced in infected host cells by

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the bacteriophage carrier. Hone teaches that the double-stranded bacteriophage phi-6 carrying exogenous genes possesses RNA-dependent RNA polymerase activity and therefore is capable of synthesizing and producing dsRNAs. See paragraphs 0006-0009.

Bej et al. teach a suicide vector plasmid DNA construct that is capable of delivering an inserted gene into cells in cell culture *in vitro*. See the entire reference.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the principle or mechanism whereby double-stranded RNA molecules are produced by an RNA-dependent RNA polymerase activity-dependent synthesis of a target nucleic acid of Lipardi et al. to mass-produce the double-stranded RNA molecules by incorporating the target nucleic acid into the double-stranded RNA bacteriophage phi-6 of Hone.

One of ordinary skill in the art would have been motivated to do so because the ordinary skilled artisan would have readily seen the common inherent property shared by the siRNAs that produce dsRNAs of Lipardi et al. and the RNA bacteriophage phi-6 that replicates an inserted exogenous genes of Hone: their ability to produce or synthesize or replicate dsRNAs depends on RNA-dependent RNA polymerase activity. In addition to the shared property, the ordinary skilled artisan would have seen the advantages of producing dsRNA molecules without the help of mechanical synthesis (e.g., RNA synthesizer) but instead by means of continuous production of double-stranded molecules in infected host cells of *Pseudomonas syringae* or any eukaryotic host cells by the bacteriophage carrier such that it would not only be cost-effective but also reduce time for producing a greater number of double-stranded RNAs due to the “continuous” or mass production of double-stranded RNAs by the infected host cells. In addition, the ordinary skilled artisan would have been motivated to deliver the target nucleic acid via the suicide vector

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plasmid DNA of Bej et al. because the suicide vector plasmid DNA was known to be useful for delivering genes into cells. Since the knowledge and skills to incorporate siRNAs into an RNA bacteriophage carrier, or to deliver the siRNAs via a suicide vector plasmid DNA, or to infect host cells with the siRNA-incorporated bacteriophage carrier for mass or continuous production of dsRNAs were within the technical grasp of one of ordinary skill in the art at the time of the invention, the ordinary skilled artisan would have had a reasonable expectation of success in arriving at the claimed invention. Accordingly, the claimed invention taken as a whole would have been *prima facie* obvious at the time of filing.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-7 and 11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 42, 53, 56-57, and 72-73 of copending Application No. 10/532,053. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the instant claims and the reference claims are drawn to a method of producing dsRNA comprising contacting an RNA target template with an RNA polymerase. As such, the scope of the invention for the instant claims overlaps with that of the invention for the reference claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

No claim is allowed.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANA SHIN whose telephone number is (571)272-8008. The examiner can normally be reached on Monday through Friday, 7am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James (Doug) Schultz can be reached on 571-272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dana Shin
Examiner
Art Unit 1635

/J. E. Angell/
Primary Examiner, Art Unit 1635

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